

## **Executive Summary**

REVISED TITLE V NO. V-99-023(REVISION 1)

OSRAM SYLVANIA PRODUCTS INC.

VERSAILLES, KY

OCTOBER 30, 2003

APRIL J. WEBB REVIEWER

PLANT I.D. # 21-239-00008

APPLICATION LOG # 55927

Osram Sylvania Products, Incorporated has applied to the Kentucky Division for Air Quality for a revised Title V permit to increase the pull rate, but not increase the emissions at their facility in Versailles, Kentucky. The plant is a Title V source because potential emissions of criteria air pollutants exceed the major source threshold.

A preliminary determination was made to approve the permit and a public notice was placed in The Woodford Sun on September 18, 2003. The comment period expired on October 18, 2003 and comments were received from the company. This permit with the appropriate changes is the proposed permit under the Title V program and shall become the final Title V permit unless EPA files an objection.

In conclusion, a thorough analysis has been made of all relevant information available which pertains to this application. The Division has concluded that the source will comply with all applicable air quality regulations and requirements. Compliance with the terms of the permit will ensure compliance with all air quality requirements. Therefore, it is The Division's final determination that a Title V permit should be issued as conditioned.

## **Commonwealth of Kentucky Division for Air Quality**

# **PERMIT STATEMENT OF BASIS**

REVISED TITLE V DRAFT NO. V-99-023(REVISION 1)

OSRAM SYLVANIA PRODUCTS INC.

VERSAILLES, KY.

OCTOBER 30, 2003

APRIL J. WEBB REVIEWER

PLANT I.D. # 21-239-00008

APPLICATION LOG # 55927

### **Source Description:**

A revised Title V permit was received from Osram Sylvania Products Incorporated, on August 7, 2003. This revision requests increases in the operating rates of the lime glass melting furnace, raw material unloading, raw material storage silos, lime glass batch weigh, lime glass batch mixing, conveyor lime glass batch, minor ingredients loading, lime furnace feed hopper, lime glass crusher, lime glass cullet handling, and basement cullet handling #1. The company has requested to maintain the emission limitations at these points, so there will be no net increase in emissions.

### **PERIODIC MONITORING:**

#### **01(P01) Lime Glass Melting Furnace**

#### **Description:**

A lime glass melting furnace with a processing rate of 14.4 tons of glass pulled per hour and 126,500 tons glass pulled per year. The

furnace shall operate at the lowest KW tested at or greater. No control equipment. Construction commenced - 1972.

PM emission rate(lb/hour)

PM= {tons of glass pulled in that calendar month x highest emission factor determined from the most recent stack test data (lbs/ton) / hours of operation in that calendar month}

The 12 month rolling average of PM shall be calculated using the following equation:

$$PM(TPY) = \left[ \sum_{i=1}^n \frac{TG \times EF \times 8760}{MH \times 2000} \right]$$

Where n is the number of months, TG is the tons of glass pulled in that month, EF is the emission factor in lbs/ton, and MH is the monthly hours of operation.

PM<sub>10</sub> emission rate (lb/hour)

= [tons of glass pulled in that calendar month x highest emission factor determined from the most recent stack test data (lbs/ton) / hours of operation in that calendar month]

The 12 month rolling average of PM<sub>10</sub> shall be calculated using the following equation:

$$PM_{10}(TPY) = \left[ \sum_{i=1}^n \frac{TG \times EF \times 8760}{MH \times 2000} \right]$$

Where n is the number of months, TG is the tons of glass pulled in that month, EF is the emission factor in lbs/ton, and MH is the monthly hours of operation.

Sulfur Dioxide:

Lb/hr limit:

$$SO = \frac{S \times F \times EF}{DH}$$

Where S is the sulfur content in the raw material feed rate, F is the raw material feed rate in tons per hour, EF is the stack test emission factor in lbs/ton, and DH is the monthly hours of operation.

Ton/year limit:

$$SO_a = \sum_{i=1}^n \frac{S \times F \times EF \times 8760}{MH \times 2000}$$

Where n is the number of months, S is the sulfur content in the raw material feed rate, F is the monthly raw material feed rate, EF is the stack test emission factor, and MH is the monthly hours of operation.

Nitrogen oxides:

Lb/hr limit:

$$NO = \frac{TG \times EF}{DH}$$

Where TG is the tons of glass pulled that month, EF is the stack test emission factor, and DH is the monthly hours of operation.

Tons/year limit:

$$NO_a = \sum_{i=1}^n \frac{TG \times EF \times 8760}{MH \times 2000}$$

Where n is the number of months, TG is the tons of glass pulled that month, EF is the stack test emission factor, and MH is the monthly hours of operation.

#### **Specific Monitoring Requirements:**

To provide reasonable assurance that visible emission limitations are met the permittee shall:

- i) Perform an annual opacity reading, or more frequent if requested by the Division, from each stack or vent using Reference Method 9. Opacity readings shall be conducted while the emission units are in operation
- ii) Perform a weekly qualitative visual observation of the opacity of emissions from each stack/vent and maintain a log of the observation. The log shall note:
  - 1) Whether any air emissions (except for water vapor) were visible from the vent/stack,
  - 2) All emission points from which visible emissions occurred, and
  - 3) Whether the visible emissions were normal for the process.
- iii) Determine the opacity of emissions by Reference Method 9 if visible emissions from any stack/vent are seen.

The permittee shall also monitor the daily glass production rate, hours of operation of the furnace, the amount of each raw material

feed to the furnace daily, the amount of sulfur fed to the furnace, and the amount of natural gas/propane burned on a daily basis

### **03(F03) Raw Material Unloading**

#### **Description:**

Unloading of the raw material with a processing rate of 100.0 tons per hour and 128,200 tons per year. The control equipment is a partial enclosure of the operation and a pneumatic line. Construction commenced - 1972.

### **03(F03) Raw Material Storage Silos**

#### **Description:**

Storage of the raw material with a processing rate of 100.0 tons per hour and 128,200 tons per year. The control equipment is a dry dust collector. Construction commenced - 1972.

PM compliance shall be demonstrated using the following equations:

Lb/hr limit:

$$PM = [(RM \times EF)/MH] \times (1-0.99)$$

Where RM is the monthly tons of raw material used, EF is the emission factor(13.5 lb/ton), and MH is the monthly hours of operation

Tons/year:

$$PM = \sum_{i=1}^n \frac{RM \times EF \times 0.01 \times 8760}{MH \times 2000}$$

Where the tons per year are obtained by summing the monthly averages and converting from lb/hr to ton per year.

PM<sub>10</sub> compliance shall be demonstrated using the following equations:

Lb/hr:

$$PM_{10} = [(RM \times EF)/MH] \times (1-0.99)$$

Where RM is the monthly tons of raw material used, EF is the emission factor(6.75 lb/ton), and MH is the monthly hours of operation

Tons/year:

$$PM_{10} = \sum_{i=1}^n \frac{RM \times EF \times 0.01 \times 8760}{MH \times 2000}$$

Where the tons per year are obtained by summing the monthly averages and converting from lb/hr to ton per year.

### **Specific Monitoring Requirements:**

To provide reasonable assurance that the visible emission limitations are being met the permittee shall:

- i) Perform an annual opacity reading, or more frequent if requested by the Division, from each stack or vent using Reference Method 9. Opacity readings shall be conducted while the emission units are in operation.
- ii) Perform a bi-weekly qualitative visual observation of the opacity of emissions from each stack/vent and maintain a log of the observation. The log shall note:
  - 1) Whether any air emissions (except for water vapor) were visible from the vent/stack,
  - 2) All emission points from which visible emissions occurred, and
  - 3) Whether the visible emissions were normal for the process.
- iii) Determine the opacity of emissions by Reference Method 9 if visible emissions from any stack/vent is perceived or believed to exceed the applicable standard.

### **08(P04) Lime Glass Batch Weigh**

#### **Description:**

The weighing of major ingredients for lime glass with a processing rate of 30.9 tons per hour and 113,357 tons per year. The control equipment is a dry dust collector. Construction commenced - August, 1985.

### **08(P05/F05) Lime Glass Batch Mixing**

#### **Description:**

The mixing of ingredients for lime glass with a processing rate of 38.9 tons per hour and 146,981 tons per year. The control equipment is a dry dust collector. Construction commenced - August, 1985.

### **08(P08) Conveyor Lime Glass Batch**

#### **Description:**

The conveying of lime glass with a processing rate of 38.7 tons per hour and 146,981 tons lime glass per year. The control equipment is a dry dust collector. Construction commenced - August, 1985.

#### **08(F16) Minor Ingredients Loading**

##### **Description:**

The loading of minor ingredients into the batch mixes with a processing rate of 0.66 ton per hour and 6,055 tons per year. The control equipment is partial enclosure of process and vents. Construction commenced – August, 1985.

To demonstrate compliance for PM the following equations will be used:

Lb/hr limit:

$$PM = [(RM \times EF)/MH] \times (1-0.99)$$

Where RM is the monthly tons of raw material used, EF is the emission factor (2.63 lb/ton), and MH is the monthly hours of operation

Tons/year:

$$PM = \sum_{i=1}^n \frac{RM \times EF \times 0.01 \times 8760}{MH \times 2000}$$

Where the tons per year are obtained by summing the monthly averages and converting from lb/hr to ton per year.

PM<sub>10</sub> compliance shall be demonstrated using the following equations:

Lb/hr:

$$PM_{10} = [(RM \times EF)/MH] \times (1-0.99)$$

Where RM is the monthly tons of raw material used, EF is the emission factor(1.31 lb/ton), and MH is the monthly hours of operation

Tons/year:

$$PM_{10} = \sum_{i=1}^n \frac{RM \times EF \times 0.01 \times 8760}{MH \times 2000}$$

Where the tons per year are obtained by summing the monthly averages and converting from lb/hr to ton per year.

##### **Specific Monitoring Requirements:**

To provide reasonable assurance that visible emission limitations are met the permittee shall:

- i) Perform an annual opacity reading, or more frequent if requested by the Division, from each stack or vent using Reference Method 9. Opacity readings shall be conducted while the emission units are in operation
- ii) Perform a bi-weekly qualitative visual observation of the opacity of emissions from each stack/vent and maintain a log of the observation. The log shall note:
  - 1) Whether any air emissions (except for water vapor) were visible from the vent/stack,
  - 2) All emission points from which visible emissions occurred, and
  - 3) Whether the visible emissions were normal for the process.
- iii) Determine the opacity of emissions by Reference Method 9 if visible emissions from any stack/vent is perceived or believed to exceed the applicable standard.

#### **09(F14) Lime Glass Crusher**

##### **Description:**

The crushing of lime glass with a processing rate of 27.3 tons per hour and 62,099 tons per year. The control equipment is the enclosure of the process. Construction commenced - October, 1972.

#### **09(P22) Lime Glass Cullet Handling**

##### **Description:**

The moving of the crushed lime glass with a processing rate of 20.0 tons per hour and 81,924 tons per year. The control equipment is a dry dust collector. Construction commenced - 1972.

Compliance Demonstration: To provide reasonable assurance that the particulate matter emission limitations (TSP and PM<sub>10</sub>) are being met, the permittee shall monitor the amounts and types of process weights added to each emissions unit. The process weight shall be determined as the average hourly tons added to the emission unit averaged over a one-month period. Average particulate emissions shall be calculated as follows:

$$PE = (PW \times PEF)$$

Where PE = Particulate emissions in lbs./hr, PW = process weight in tons/hr, and PEF = particulate emission factor in lbs./ton of process weight.

**Specific Monitoring Requirements:**

To provide reasonable assurance that the visible emission limitations are being met the permittee shall:

- i) Perform an annual opacity reading, or more frequently if requested by the Division, from each stack or vent using Reference Method 9. Opacity readings shall be conducted while the emission units are in operation.
- ii) Perform a weekly qualitative visual observation of the opacity of emissions from each stack/vent and maintain a log of the observation. The log shall note:
  - 1) Whether any air emissions (except for water vapor) were visible from the vent/stack,
  - 2) All emission points from which visible emissions occurred, and
  - 3) Whether the visible emissions were normal for the process.
- iii) Determine the opacity of emissions by Reference Method 9 if visible emissions from any stack/vent is perceived or believed to exceed the applicable standard.

**CREDIBLE EVIDENCE:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements.

At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

**ORIGINAL TITLE V STATEMENT OF BASIS**

**Source Description:**

A Title V permit application for Osram Sylvania Products Incorporated, the glass plant, was deemed complete on December 11, 1997. The source manufactures glass casings for phosphor bulbs. The bulbs are sent to an adjacent lamp plant for finishing.

The glass plant manufactures lime glass and lead glass. The major hazardous pollutants emitted from the source are hydrogen fluoride, lead, and antimony. A stack test was performed in 1987, but much of the process and constituents in the glass has changed since then. A performance test will be required by the this Title V permit.

The process is a continuous process for both lime and lead glass. The ingredients are loaded and mixed before going to the respective melting furnaces. The storage and conveying of the material produces mostly PM emissions. The glass is coated and etched with fluorides upon exiting the melting furnaces. The fluorides from the plant are mainly emitted from the etching process. The spent glass is crushed and the glass cullet is used as ingredients in subsequent batches.

Original Title V Statement of Basis

by Rebecca Cash

**Source Description:**

A Title V permit application for Osram Sylvania Products Incorporated, the glass plant, was deemed complete on December 11, 1997. The source manufactures glass casings for phosphor bulbs. The bulbs are sent to an adjacent lamp plant for finishing.

The glass plant manufactures lime glass and lead glass. The major hazardous pollutants

emitted from the source are hydrogen fluoride, lead, and antimony. A stack test was performed in 1987, but much of the process and constituents in the glass has changed since then. A performance test will be required by the this Title V permit.

The process is a continuous process for both lime and lead glass. The ingredients are loaded and mixed before going to the respective melting furnaces. The storage and conveying of the material produces mostly PM emissions. The glass is coated and etched with fluorides upon exiting the melting furnaces. The fluorides from the plant are mainly emitted from the etching process. The spent glass is crushed and the glass cullet is used as ingredients in subsequent batches.

**Comments:**

Baghouse, Electric Precipitator, Activated Carbon, Tube Shell Condenser, Centrifuge: Most efficiencies are 95-98 % efficient.

Emission factors came from appropriate sections of AP 42 and previously approved emission factors. Applicable regulation: 401 KAR 50:035, 401 KAR 59:010, 401 KAR 61:020, 401 KAR 63:021, 401 KAR 63:022, 401 KAR 53:010.

Source is exempt from 401 KAR 59:105, New process gas streams, since the potential to emit for sulfur dioxide is under 100 tons per year.

**Emission and Operating Caps description:**

The glass plant was issued a synthetic minor operating permit (F-98-010), with limits on most of the lime glass manufacturing units to preclude PSD applicability.

**Operational Flexibility:**

None.

**Credible Evidence:**

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements.

At the issuance of this permit, Kentucky has not incorporated these provisions in its air quality regulations.

**Periodic Monitoring:**

For emission points 01-09, 12, 13, 15, 20, and 21 the permittee shall monitor the following:

- a) To provide reasonable assurance that the visible emission limitations are being met the permittee shall:
  - I) Perform a quarterly opacity reading, or more frequent if requested by the Division, from each stack or vent using Reference Method 9. Opacity readings shall be conducted while the emission units are in operation

- ii) Perform a daily qualitative visual observation of the opacity of emissions from each stack/vent and maintain a log of the observation. The log shall note:
    - 1) Whether any air emissions (except for water vapor) were visible from the vent/stack,
    - 2) All emission points from which visible emissions occurred, and
    - 3) Whether the visible emissions were normal for the process.
  - iii) Determine the opacity of emissions by Reference Method 9 if visible emissions from any stack/vent is perceived or believed to exceed the applicable standard.
- b) To provide reasonable assurance that the particulate matter emission limitations (TSP and PM<sub>10</sub>) are being met, the permittee shall monitor the amount and type of process weight added to each particulate matter emissions unit. The 3-hour average process weight rate shall be determined by dividing the total tons added to the emission point each month by the hours of operation for the corresponding month. Average particulate emissions shall be calculated as follows:

$$PE = (PW \times PEF)$$

Where PE = Particulate emissions in lbs./hr, PW = process weight in tons/hr, and PEF = particulate emission factor in lbs./ton of process weight.